

## Conceived Limits for Manipulated Reproduction

Inger Bierschenk<sup>1</sup>

*Abstract* This article is focusing on the notion that the design of a civilization is perceivable to its citizens only to the degree that they have the cognitive instruments to judge it properly. With the purpose to clarify how two Swedish female adolescents comprehend the information structure of a utopian society, their written responses to Huxley's *Brave New World* are studied. The method used for the analysis is Perspective Text Analysis (PTA/Vertex), which is founded on the Agent-action-Objective (AaO) axiom. Since it has the capacity to get at the morphogenetic development of a text, the expected outcome is structural stability. The kinetic and thermodynamic functions are producing spaces, which provide for the development of energy landscapes. Concerning the constraining impact of Huxley's utopian society on emergent state attractors, it is shown that the termini of the attractors produced by the participants, support information structures in coherence with the critical factors of Huxley's challenging world. In addition, the termini point at individually perceived spheres of civil characteristics.

### *The Import of Civilization*

Design is the concept of fashion in many areas of society today. This article is considering the ideal design of society itself. The search for ideal solutions of societal problems has been the focus of utopians since Plato depicted utopia in the republic of a city state. Huxley is also modelling the city state and his orientation is in agreement with the social sciences standard model of the 1930's. Despite the worries Huxley tried to communicate through his breeding society and despite the effects of Galton's eugenics a generation earlier, Caplan (2004) expresses a view far away from doomsday prophecies. He means that human nature is governed by the laws of evolution and thus it is not static. Any essence that gives us reasons to glorify a particular phase of this nature is, according to him, not the case, since it has elements that have proven maladaptive in the past.

However, artificial breeding implies a risk for deteriorating human civilisation. Experimental evidence, namely, underpins that breeding, e.g. in mouse management, may cause dullness. Strictly speaking, the researchers' alarm regarding mice may as well regard men. Others have expressed concerns about advanced genetic manipulations. Holden (2004) for example reports on ethical guidelines that would prohibit child conception. However cell biologists and neuroscientists are extremely eager to assent manipulated reproduction and assist in biological baby design. Thus, like modern bio-medical services, the scientists of Huxley's society are attempting to utilize the individuals as human resources. Since the utopian society is constructed on the premise that the quality of individual life can be improved, utopianism is founded on the idea that nothing can go wrong due to genetic manipulation.

The gateway is from pre-implanting diagnosis to genetic manipulation and artificial insemination. To a woman of today, the development concerning new reproduction techniques should be challenging, especially as women may choose to be inseminated, irrespective of marital status and sexual orientation. The emphasis in the task formulation is on the ability to express conceived consequence of manipulated reproduction in a reasonably clear discourse.

<sup>1</sup> Correspondence and requests for materials should be addressed to Bernhard Bierschenk, Department of Psychology at Lund University, Box 213, SE-221 00 Lund, Sweden. Additional information on theory and method development may be found at the URL address <http://www.sites.google.com/site/aaOaxiom>

## Method

Recent analyses have shown that one's conscious interaction with real or virtual societies is closely connected to one's synthesising abilities. However, little, if anything is known about inferring the details from its appearance in a discourse. Most of its production becomes evident through the interaction of two kinds of strings. String production rests on the realisation of kinetic energy. Individual strings appear as carrier of information either in the form of virtual strings or as material strings. Hence, when the textual surface is altered, produced kinetic energy is forming the sequencing space of the string dynamics.

The formation of patterns of strings is not only the result of self-organising processes but requires the concept of self-reference as information synthesising mechanism. While self-organisation can be observed in the neighbourhood of a thermodynamic equilibrium, the self-reference mechanism is pushing toward equilibrium and thereby producing super string symmetries. This process continues until all parts are in balance. The involved phase-transitions are at a distance from the thermodynamic equilibrium dependent on non-linear operating processes. In balancing the processes, order is guaranteed. However, a most significant step forward in the exploration of envisioned societal circumstances will occur, if it is possible to manifest the mechanism for the formation and emergence of perceived or conceived "disorder".

The present experiment concerns the reader's understanding of the affordance of a utopian society and relating this understanding in writing. Through the text producer's genuine writing style we will get to know something about the materials observed. Because, when a text comes into view, it has incorporated the structure of the writer (Agent, Intention) and that of the context (Objective, Orientation). This structural embodiment through natural language is axiomatic, which has been discovered and experimentally proven by means of the AaO-axiom (B. Bierschenk, 1991). The rhythmic forward flow in the (A) component as well as in the (O) component is creating information (I. Bierschenk, 2011). The principle of rhythm in textual production has been the foundation of Perspective Text Analysis (PTA), version *Vertex* (B. Bierschenk, 2001, 2005; I. Bierschenk & B. Bierschenk, 2004). An example of textual rhythm expressed as temperament can be found in I. Bierschenk (2012).

Recent implementations of the algorithmic operations concern the calculation of rotational writing movements (B. Bierschenk, 2004). These movements shall in the following be geometrically represented by magnitudes and result in "energy landscapes" (Wales, 2003), produced with SigmaPlot, Version 11 (2008). The scientific name of this type of measurement is Functional Text Geometry, which is founded on "spinning dots" (B. Bierschenk, 2001). Available on-line is a tutorial as well as an extended theoretical foundation (B. Bierschenk, 2011; I. Bierschenk & B. Bierschenk, 2011). Therefore the technical details of the method will be omitted here.

### *Participants*

Since the experimental set up concerns the manipulation of human reproduction, two young women, about 18 years of age, have been selected. Previously, both had taken part in an upper secondary study program about "literature and society", which was running for three years. The program was taught by the same teacher, although within different instructional contexts. Details about design and selection principles together with results are to be found in B. Bierschenk and I. Bierschenk (2004, 2005). To maintain the correspondence with these studies, the present study keeps the designation "Participant (B)" from 2004, while the student of the 2005 study gets the designation "Participant (C)". Participant (B) is identified as a social science student, while Participant (C) is recognized as a fine arts student.

### *Materials*

Due to the characterisation of the proper utopian society, *Brave New World* (Huxley, 1932/2003) was used for the testing. It can be assumed that most of the readers know the main characteristics of the novel. One example has been presented by Ridley (2003, pp. 149-150), another by McKibben (2003, p. 105), who is of the opinion that it is Aldous Huxley who has set the style for the genre with this work. In his preface fifteen years later, Huxley admits that his work is missing a lot of literary qualities but states that as a book about future it should be of interest only if its prophecies look like they could be true. However, there should be no doubt about Huxley's irony, when he is naming this future new world as "brave", because where McKibben as well as Orwell are picturing the horrific world of a totalitarian society, Huxley's more subtle strategy implies a manipulation of the world biologically, i.e., not from above but from the inside. It is expected that the two females in their discourses can reasonably well reflect the essence of the novel, almost three generations later.

### *Procedure*

After some introductory lessons and/or discussions about futurism in general and its expression in cultural life, the participants were given the task to read Huxley's novel for a written personal statement. The instruction, given after finished reading, was the following:

*Instruction:* The word 'brave' in the title of Huxley's novel *Brave New World* may among other things mean 'challenging'. Comment on what you think is particularly challenging with this novel.

The treatment of the produced text must begin in behavioural terms. As performance, the Participants are producing structural relations which are resulting in Potential Energy Surfaces (PES). These make up the precondition for the production of Free Energy Surfaces (FES). To catch the fundamental implications of the produced discourses through FES it is required that the underlying strings of graphemes are generating valid textual resonance spaces. The evolution of a space through text production presupposes the presence of a reversible synthesising mechanism. This mechanism builds on the Agent-action-Objective (AaO) paradigm, which has the capacity to capture emergent [AaO] units and to track their growth in complexity. Through individual variations in the growth of its components as well as their variations in nesting, it is shown that structural stability and thematic variability is generating corresponding specificity in their geometric shapes. The applied Zipper-function (B. Bierschenk, 2012) shows that folding has empirical value, because it regards the transformation on invariants as relations between mutually dependent states. These relations can be named. Thereby it is made evident that produced and shaped state spaces can be explained on the basis of multiply stable states which are organising themselves into different state attractors and through which the invariants can emerge.

## **Results**

The presented written discourses were originally produced in Swedish and thus, the results refer to the Swedish version. A literal translation into English is provided here to give the reader a feeling for the general conceptions of the participants and a better understanding of the results.

### ***Participant (B)***

*Original Swedish, Participant (B):* Jag kommer först att tänka på den fria sexualiteten och promiskuiteten. Tankarna om att familjen är något negativt. Jag vet inte så mycket om 30-talet, men jag kan verkligen tänka mig att detta var tankar som skilde mycket från verkligheten. Även saknaden att sträva efter någonting, oftast lyckan,

#### 4 Inger Bierschenk

kan nog har uppfattats som ny. # Jag tror också att porträtten över människors sensationslystnad och hur man för nyhetens behag inte känner någon empati. För så som vilden blir behandlad i slutet, det är ju så vi faktiskt behandlar personer i vår värld, t.ex. kändisar. Så behandlas även brottsoffer. Alla som kan skapa ett par stora rubriker på första sidan av en skvaller- eller kvällstidning. Det är sorgligt och Huxleys beskrivning utmanar oss än idag att ta en titt på oss själva nu. Ingen har empati. Ingen bryr sig om något, det är bara soma och egoism. Ett avskärmat sinne från verkligheten. Är det så vi vill vara? Är det så vi vill att vår värld ska se ut? # Alla är lyckliga men ingen bryr sig. Alla är nöjda och kan inte se bakom något eller kritisera. Alla är som hjärntvättade utan mening i livet. Vill vi också bli sådana, avtrubbade? Det är dit vi är på väg med vår mobbningstrend och dylikt. Empatin tar slut. Kvar är bara ett fånigt soma-leende på läpparna och allt blir meningslöst, världen får stagnera.

*Literal translation, Participant (B):* I come first to think about the free sexuality and the promiscuity. The thoughts about that the family is something negative. I do not know much about the 30's, but I can really imagine that this were thoughts, which differed much from the reality. Also the loss to strive for something, very often pleasure, may probably have been conceived as new. # I believe also that the portrait over people's carving for sensations and how one for the pleasure of the latest fashion's appeal is unable to feel any empathy. For, how the savage is being treated at the end, this is, you know, in fact how we are treating persons in our world, e.g., famous people. Infringed persons dealt with in the same way. Everyone, who can contribute with some big headlines on the first page of a gossip- or evening paper. This is sad and Huxley's description is challenging us even today to take a look on ourselves now. Nobody has empathy. No one takes care for anyone. It is only soma and egoism. A screened off sensation from reality. Is it so we wish to be? Is it so we wish that our world shall look like? # Everybody is happy but nobody worries. Everyone is satisfied and cannot look behind something or criticise. Everybody is like being brainwashed without meaning in life. Do we also wish to become like that, blunted? It is in this direction we are on the way with our mobbing trends and the like. Empathy is drawing to an end. Remaining is only a stupid soma-smile on the lips and everything becomes meaningless, the world may stagnate.

This text can be observed as a substantially extended surface layout, which seems to depend on great work intensity by the producer. The text gives the impression of a resonating and highly symmetric style. Relative phase stability in the autonomously developing of PES has shown an impressive overall symmetry. The PES have to be envisioned as a necessary prerequisite to FES. In the following, as a product of changing attitudes, FES can be studied in the Figures 1-2.

##### *Orientation*

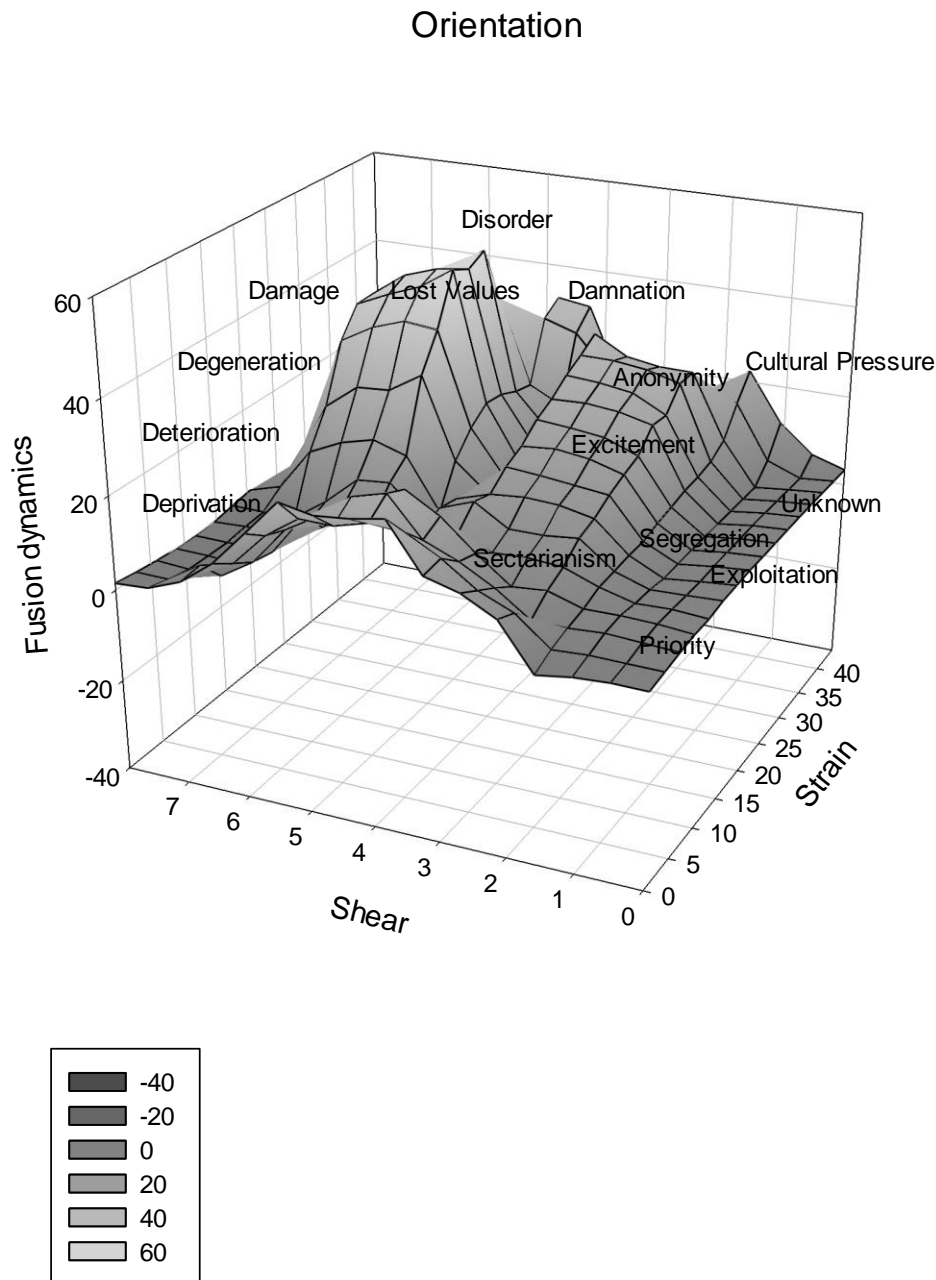
To begin with the Orientation, which is laid out through explicit mountain formations, the number of folds pro interval is relatively large, which implies a large potential for progression. Moreover, the high mountains imply that there is not much implicitness. The path is portrayed with the selection of fifteen descriptors that make up spheres of energy concentration.

The first sphere to be discussed appears in the lowland area, described with *Priority*, *Exploitation*, and *Unknown*. The termini stand for the Participant's feeling for people's submission to an unrecognized existence because of imperfect social control and the use of people for undignified purposes. Thus *Cultural Pressure* is characterizing the atmosphere instead of the positive mechanisms that should be the social building blocks. Rather than collaboration, the Participant observes *Segregation*, which will be the result when the described society sets off along these dangerous roads.

Next group consists of the termini *Sectarianism*, *Excitement*, and *Anonymity*. The imminent danger that the society runs when its citizens are maltreated is obviously fostered by the isolation that coexists with an unrecognized existence. Corrupted behaviour towards fellow human beings can be seen due to the loss of functional control and thus decent and acceptable borders. The functionalistic tyranny of anonymity is the effect of a degraded crowd.

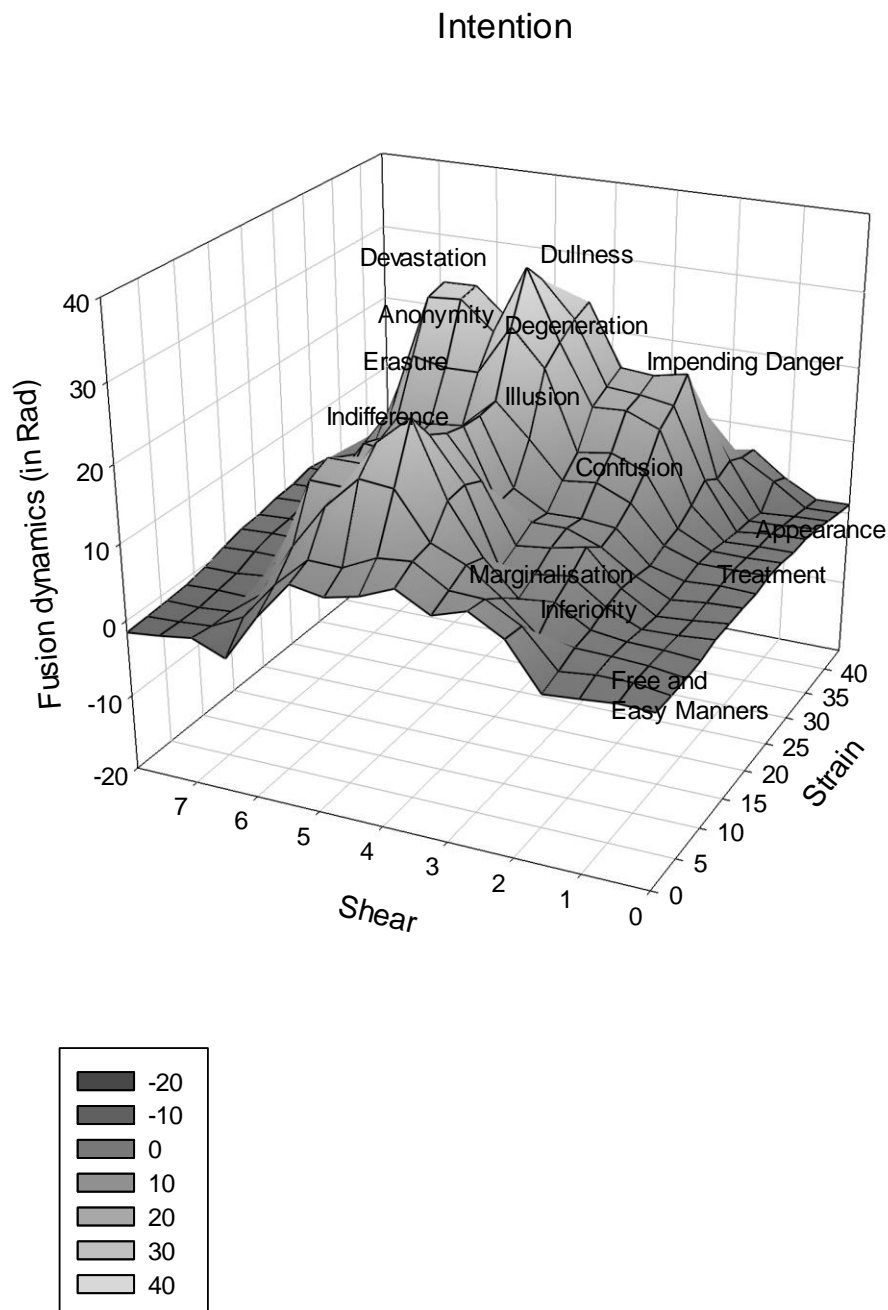
In this spirit, the Participant expresses a lament over a community that is undermining itself with evil intentions. Thus *Damnation* is a highly concentrated terminus, expressing extreme disgust with a future of this miserable kind.

Along the leftmost and last mountain slope we find an extended line of termini, expressing the growing negative effects of social indifference. Thus, *Deprivation* means loss of identity and uniqueness, which must inevitably end up in *Deterioration*. It means that the civilisation has gone beyond critical limits driven beyond traditional barriers. As a consequence, the Participant is forecasting *Degeneration*, since the citizens no longer have the intellectual and physical strength to see through the banalities of their lives.



**Figure 1** Participant (B): Layout of the Orientation space

*Damage* stands for the absence of natural stimulation, something that is essential for individual development, and tokens become victims of drugs and false happiness. Special focus is therefore on *Lost Values*, which means that the civilisation has got a grip on the mentality of the individual and that cultural values have been substituted with prostitution, in every sense. Confronted with this fact, it is realised that the society is collapsing, which is expressed by the last and most concentrated terminus, namely *Disorder*.



**Figure 2** Participant (B): Layout of the Intention space

*Intention*

The Participant's perspective is laid out in a somewhat different landscape. Like the Orientation, it shows very little implicitness. However, it is more concentrated and less expanded. Fourteen descriptors will be paid attention to.

In the lowland area appear *Free and Easy Manners*, *Treatment*, and *Appearance*. Free sexuality and promiscuity is in focus, which is expressing a kind of activity that makes people in fact unfree, because of involuntary participation. Treatment means in this context to use a person for collective reasons in the sense of maltreatment or mobbing. When manners are emphasised that would be unjust to the individual, the social texture will ensure that their real character will not be unravelled. It is fatal for the society in the long run when things do not appear as they really are.

By drug addiction the human beings escape reality, disappear into a haze of irresponsibility. The result of this state appears in *Inferiority* and *Marginalisation*. When people do not understand whether themselves nor one another, there is no precondition for enjoying life; their destiny is *Confusion* as they are confronted with both risks and mirages. Such an unstable ground is undeniably an *Impending Danger*.

*Indifference* is a state, which follows one's sense of being inferior, because it contains aspects of defence. Along the same line of thought therefore appears *Illusion*, which is illustrating the false freedom by masking behaviour. The immediate implication of *Anonymity* is an attested loss of honour. Obviously, the conditions, marking the stages of progress of a technologically very advanced society are arousing anger about the unworthy treatment of individual life. Thus *Erasure* and *Devastation* both refer to the Participant's apocalyptic prophecies. *Degeneration* must be seen as the utmost consequence of a civilisation void of empathy. The final outcome of the effects of Huxley's social model can be interpreted in line with the relevant expectation concerning breeding. *Dullness* in this context means that the entire world loses something significant for its existence, because one cannot expect any progress from manipulated (domesticated) humans.

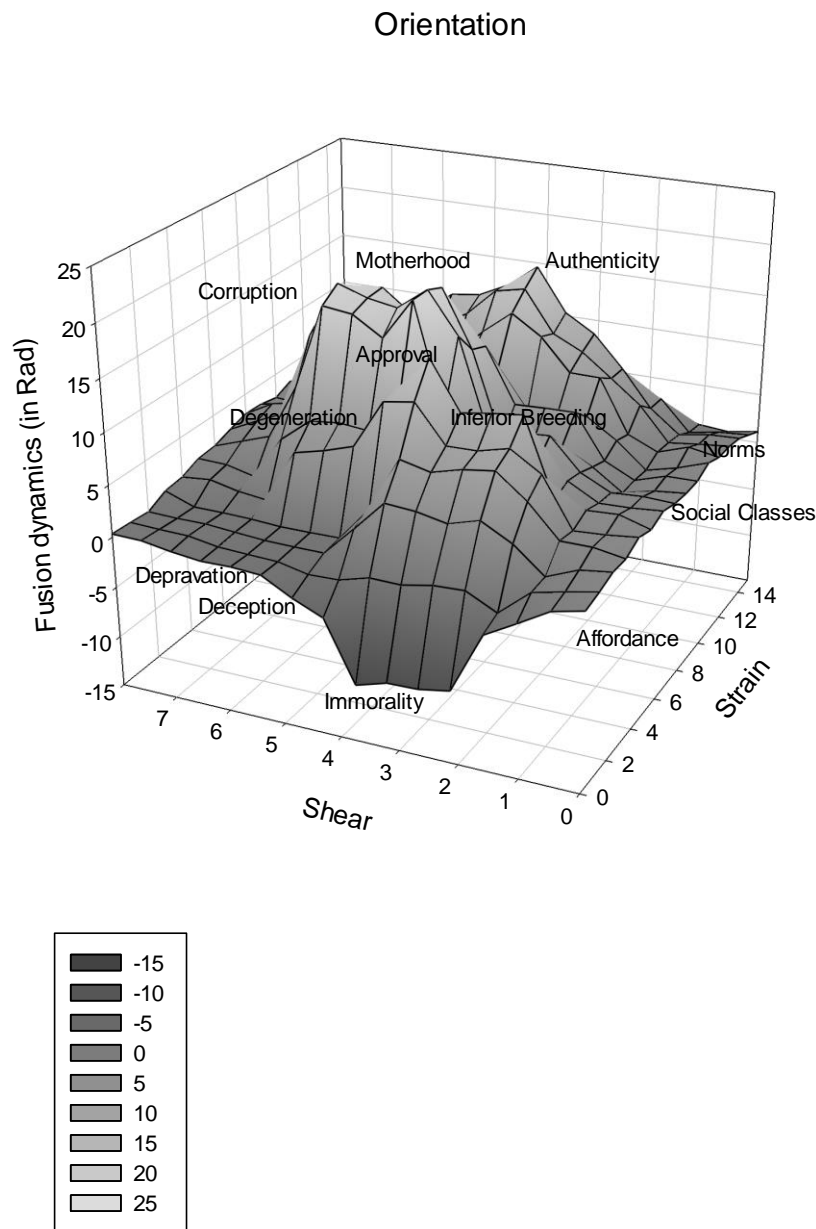
In the following the FES of Participant (C) are presented in the Figures 3-4, which are based on the following discourse:

*Participant (C)*

*Original Swedish text, Participant (C):* En sak som kan anses utmanande i boken är att den gör narr av traditionella värderingar som med all säkerhet var ännu starkare på trettioalet än idag. Detta rör framför allt föräldraskap, monogami och syn på samhällsklasser. I Huxleys bok är allting tvärtom; det är oanständigt att prata om barnafödelse, ordet mamma får alla att rodna, det är märkligt och fel med monogami. Och istället för att möta svårigheter flyr man det med hjälp av soma. Klassamhället påivras och det är inget konstigt att vissa är mindre värda.

*Literal translation, Participant (C):* One thing that can be considered to be enticing in the book is that it makes fun of traditional values, which with all certainty have been even more powerful in the thirties than today. This concerns foremost parenthood, monogamy and opinion on social classes. In Huxley's book is everything reversed, and it is indecent to speak about childbirth, the word mammy makes everyone blush up, it is strange and wrong with monogamy. Instead of to meet difficulties, one is escaping it with the help of soma. The class society is supported zealously and it is nothing strange that some have lesser value.

This text is condensed and highly declarative. It gives an impression of distance, since the producer seems to have done an analytic job before writing down the essence.



**Figure 3** *Participant (C): Layout of the Orientation space*

#### *Orientation*

*Affordance*, *Social Classes* and *Norms* are the first termini to appear in the lowlands. They indicate that the Participant is letting the traditions of marital pairing be in focus to begin with. To a well functioning society belongs the affiliation to a social class, whose norms guarantee the feeling of confidence in the citizens, among other things because they are sticking to one partner.

Climbing upwards we find the central terminus *Inferior Breeding*, expressing a deep concern about childbirth that is manipulated. Such a novel technique entering the biological domain is conceived as indecent. The indignation felt when traditional values are broken



down is resulting in a sense of *Immorality*, which appears in the very depth supported by *Deception* and *Depravation*. It is demonstrating the absence of any ethical concern. Humiliating the individual's authenticity right from the beginning of incubation on one hand and the intention of producing a corporate society on the other has special consequences. The Participant perceives it as very provoking that the fundamentals of life can be violated. These three termini together express a fear of damaging encroachment on biological functions. The result is *Degeneration*.

The most concentrated terminus to be discussed is described with *Motherhood*. In this respect, being a mother means having the capacity to establish a maternal relationship to another person, meaning taking on responsibility. The fashion of biological baby design is conceived to corrupt motherhood. Therefore, *Corruption* stands for the absence of both societal and biological justness.

The terminus *Authenticity* marks the global or final state attractor. It is pointing above all to the particular way of dealing with what is original and what is artificial. Central is the easiness in the interaction with the concept of essence. This utilitarian approach is insensitive to moral concerns as necessary part of any comfortable social climate. The gateway is from *Approval* of genetic manipulation to subconscious acceptance of the premise that the quality of individual life can be artificially improved by medical inventions.

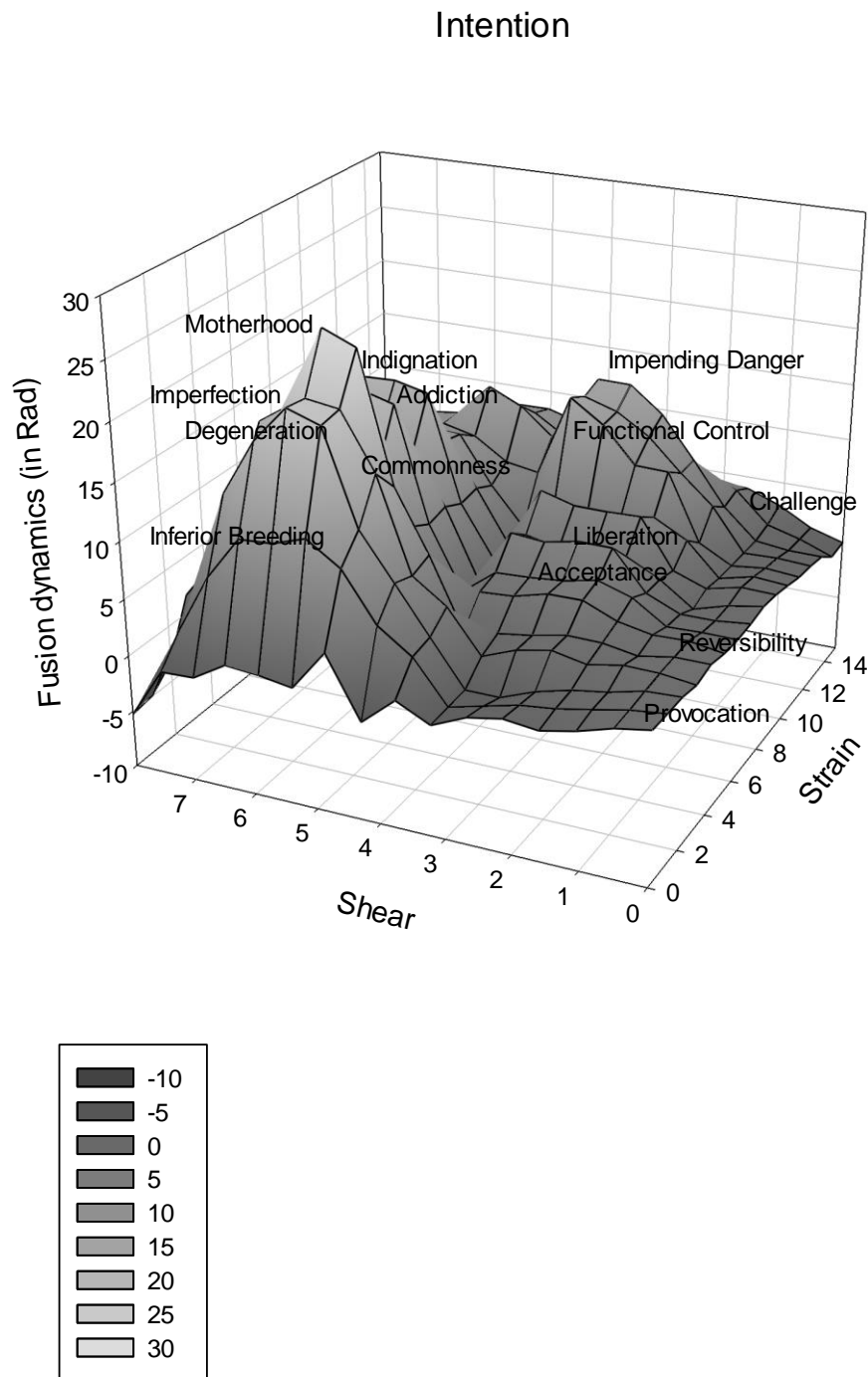
### *Intention*

A society that has lost its moral compass is the frame of the Participant's perspective. *Reversibility* demonstrates the focus on a future living characterised by reversed social and biological order. A deep frustration is evoked with this utopian state in the termini *Provocation* and *Challenge*. Most provoking seems to be the pressure on the humans to act beyond the cultural values, as demonstrated by the termini *Acceptance* and *Liberation*. When citizens are liberated according to the new societal doctrine, then the stabilising factor in their social life will be disrupted. The effect is expressed as *Impending Danger*. The terminus *Functional Control* in this connection shall be conceived as the Participant's evocation of the spirit of the thirties, where she perceives a possible danger in controlling birth, with the consequences it may have on manipulating heredity.

Since Huxley's civilisation is constructed on the premise that the quality of individual life can be improved by design, utopianism is part of the modern debate of *Motherhood*. The gateway is from pre-implanting diagnosis to genetic manipulation and artificial incubation. However, the global or final state attractor implies *Indignation*. Obviously, the conditions, marking the stages of progress of a technologically very advanced society are arousing anger about the unjust and consequently unworthy treatment of humans.

In its neighbourhood appears a distinctive feature, which is addressing *Imperfection*. This terminus underlines the seriousness of compromising individual fitness. Biogenetic engineering cannot substitute for the loss of its naturalness. However, any assault on the individual's authenticity will not uniformly degenerate people. Insistence on the meaningless construction of individuals as artifacts must end ultimately in the *Degeneration*. The link to degeneration and drug-dependency is turning into *Addiction*. This implies that addicted people are persistent in their sensation seeking behaviour. In the context of its *Commonness*, addiction leads to behavioural situations where everybody is trying to gain pleasure.

Attested loss of fitness is the result of *Inferior Breeding*. Without doubt, this space is demonstrating the apprehended dependency between inferior breeding and de-humanisation.



**Figure 4** *Participant (C): Layout of the Intention space*

## Discussion

Huxley's utopia is representing the effects of an extreme utilisation of humans and thus is going beyond what any society in the real world would be able to offer, namely a society that is free of tension, according to the discussions in McKibben (2003, p. 55) and Ridley (2003, p. 230). The results do not give an answer to Huxley's own reasoning about

whether his future civilization could be true or not. However, according to the comprehension of two young Swedish female readers of today, his novel has produced two different perspectives on the challenging new world:

Participant (B) shows a high degree of social awareness and expresses anger over the cultural depravation that is the result of the imposed manners (*Disorder* in the Orientation, and *Dullness* in the Intention). Her perspective is centred on the use of human beings and its effects on societal functioning. This instrumental approach is foreign to the individual itself, since it leaves no room for individual growth and development. Participant (C) reflects the forming of a Gestalt, which comprises maturation in both individuals and civilisations (*Motherhood* in both the Orientation and the Intention). Her perspective is concentrated on a sensible approach to human dignity and demonstrates that the utilitarian methods for generating life quality are insensitive to moral concerns as necessary part of any comfortable social climate.

By its eagerness to serve the citizens with technical progress at several levels, social engineering lacks a moral component. In a study where three futuristic novels were compared, it was found that a novel writer contributes to the edification of a public only if he/she translates some structural dimension in an ongoing civilisation process. To this translation belongs a sense of public morality. According to sixty students, Huxley's novel most significantly describes a public morality. Or, as one of the students formulated his comprehension (I. Bierschenk, 2000, p. 12): "Just think, if as a matter of fact, he [Huxley] isn't critical or moral but is suggesting a solution to a world-wide problem?" – i.e., the way in which science may be a means to deliberate humanity, for good and evil. In the perspective of Participant (B) the conceptual depth of moral indignation does not seem to be reached, while the perspective of Participant C) implies "moral priority" over science and technology, as Sperry (1983) expresses it. She is verifying that a powerful intuition is at work against any biological revision of the human species.

Finally, it would not be out of place to remind of the differences in perspective. It may be due to different outlook, in the sense that the two students have preferred distinct study programs. The social science program at the Swedish upper secondary school is focused on civil society and its institutions, in historical and present times. The fine arts program, on the contrary, stresses cultural history and practical exercises in art production. That Participant (B) perceives the brave new world in a civilization perspective is therefore not surprising. Participant (C) for her part demonstrates very clearly that aesthetics shares properties with morality.

## References

- Bierschenk, B. (1991). The schema axiom as foundation of a theory for measurement and representation of consciousness. *Cognitive Science Research*, 38. Lund University. (ERIC, ED 338 650)
- Bierschenk, B. (2001). Geometric foundation and quantification of the flow in a verbal expression. *Cognitive Science Research*, 81. Lund University & University of Copenhagen. (ERIC, ED 459 193)
- Bierschenk, B. (2004). Transformation of a word model: String rotation and pattern dynamics in the production of abstract geometric spaces. *Kognitionsvetenskaplig forskning*, 92. Copenhagen University & Lund University.
- Bierschenk, B. (2005). Differentiating limits for knowability. *Cognitive Science Research*, 97. Copenhagen University & Lund University.
- Bierschenk, B. (2011). Functional text geometry: The essentials of Perspective Text Analysis. *Cognitive Science Research*, 101. Lund University & University of Copenhagen.

- Bierschenk, B. (2012, January). *The Zipper Mechanism*. [On line]. Available: <http://sites.google.com/site/aaaoxiom/tutorial/>
- Bierschenk, B., & Bierschenk, I. (2004). Intuitive judgment in the context of constructivism. *Cognitive Science Research*, 93. Copenhagen University & Lund University.
- Bierschenk, B., & Bierschenk, I. (2005). Sustainability of authenticity. *Cognitive Science Research*, 94. Copenhagen University & Lund University.
- Bierschenk, I. (2000). Do the humanities contribute to education? *Cognitive Science Research*, 75. Copenhagen University & Lund University. (ERIC, ED 449 189)
- Bierschenk, I. (2011). Ett ekologiskt perspektiv på språk och textanalys. [An ecological perspective on the analysis of language and text]. *Cognitive Science Research*, 98. Copenhagen University & Lund University. (Lund University: Open Access)
- Bierschenk, I. (2012). Two temperaments seen through Strindberg's Miss Julie. *Cognitive Science Research*, 102. Copenhagen University & Lund University. (Lund University: Open Access)
- Bierschenk, I., & Bierschenk, B. (2004). Diagnose der Leistungsheterogenität durch die Perspektivische Textanalyse: VERTEX [Diagnosing heterogeneity in achievement by means of Perspective Text Analysis: VERTEX]. In: W. Bos, E.-M. Lankes, N. Plaßmeier, & K. Schwippert (Eds.), *Heterogenität: Eine Herausforderung an die Bildungsforschung [Heterogeneity: A Challenge to Educational Research]* (pp.16-28). Münster: Waxmann.
- Bierschenk, I., & Bierschenk, B. (2011). Perspective Text Analysis: Tutorial to Vertex. *Cognitive Science Research*, 100. Copenhagen University & Lund University. (Lund University: Open Access).
- Caplan, A. (2004). Is biomedical research too dangerous to pursue? *Science*, 303, 1124.
- Holden, C. (2004). White House Panel issues its final word on reproductive technology. *Science*, 304, 188.
- Huxley, A. (1932/2003). *Du sköna nya värld*. Stockholm: Lind & Co. (Original work published 1932: *Brave New World*). Ed. L. Erikson and Trans. G. Tiselius. Stockholm: Wahlström & Widstrand.
- McKibben, B. (2003). *Enough. Staying human in an engineered age*. New York: Holt.
- Ridley, M. (2003). *Nature via nurture. Genes experience and what makes us human*. New York: HarperCollins.
- SigmaPlot (2008). *Exact graphs for exact science. User's manual* (Version 11). Chicago: SPSS Inc.
- Sperry, R. W. (1983). *Science and morality priority*. Oxford: Basil Blackwell.
- Wales, D. J. (2003). *Energy landscapes: Applications to clusters, biomolecules and glasses*. Cambridge: Cambridge University Press.